BELL ATLANTIC

ATTACHMENT D

PHYSICAL & VIRTUAL COLLOCATION
COST STUDIES

ASSUMPTIONS

Attachment D

The following document contains a detailed explanation of the assumptions and methodology that were used to develop the DS3 and DS1 interstate collocation investments, costs and expenses. Please refer to the cost study spreadsheets, which contain the workpapers used to calculate the investments, costs and expenses.

I. GENERAL

A. Elements studied:

1. Cable Support - Physical
2. Cable Support - Virtual
3. DS3/DS1 Cross Connect - Physical
4. DS3/DS1 Cross Connect - Virtual
5. Design and Planning Physical
6. Design and Planning Virtual
7. Vendor Installation of Collocator-Provided Virtual Equipment
8. Power for Physical

B. Recurring Cost Assumptions:

1. Annual cost factors (ACFs), which are based on mathematical relationships between various cost components (typically, investments and expenses). The sources for cost factors include the financial database, engineering studies, economic consultants, corporate finance, tax, and capital recovery organizations. These ACFs were multiplied by the investment and divided by 12 to obtain the monthly recurring cost.

2. The planning period used in the cost study was five years, from 1995 through 1999 using and estimated five-year demand growth.

3. No inflation or productivity factors were applied, since it was anticipated that the prices, labor rates, labor hours and demand denominators would be updated frequently and new filed rates done every 12 to 24 months if necessary. It was expected that this procedure would account for inflation and productivity on a forward-looking basis. Also, the demand denominators are very difficult to project five years into the future, due to the dynamic nature of collocation, so this study will be updated frequently using revised demand numbers. See Section II.B for an explanation of the demand denominators.

4. The investment-based factor method of developing the recurring maintenance costs has been replaced with the activity-based cost method on most major accounts, such as digital central office engineering,, cable and conduit. Maintenance on land and buildings was

calculated using the maintenance factor. Estimated recurring labor hours multiplied by the directly assigned labor rates were used for developing the recurring monthly activity-based costs.

5. The investment-based factor method of developing the recurring administration expenses was used in this study.

6. Land, building, power/common equipment applied where appropriate.

B. Nonrecurring Cost Assumptions:

1. Average 1995-96 fully assigned labor rates were used since no overhead factor was applied to the nonrecurring costs.

2. No inflation or productivity factors were applied since it was expected that updating the studies frequently would make these factors unnecessary. The two year labor rate was used for this reason also.

II. VIRTUAL COLLOCATION

A. Cable Support Element - Virtual

In virtual collocation arrangements, the collocator has two different scenarios that could be used dependent on the option a collocator elected when delivering the collocator fiber to the central office. The collocator has an option of providing fiber cable of sufficient length to extend the cable to the Bell Atlantic virtual collocation space, or provide fiber cable of sufficient length to be spliced in the central office vault to existing Bell Atlantic fiber cable. Based on the experience gained from existing virtual collocation arrangements, a 50/50 weighting of each scenario was used to develop an average.

1. Scenario 1:

a. The average lengths of cable rack and conduit, capacities of all components and other parameters were estimated by Bell Atlantic field personnel based on their direct experience with this type of equipment. The lengths of each component are shown on the spreadsheet.

b. This arrangement assumes that the collocator will provide standard non-connectorized, non-fire retardant 24 pair fiber cable of sufficient length to pull to the Bell Atlantic equipment area so that no spice will be needed in the cable vault.

c. A combination of cable rack and conduit from the vault to the fiber distribution frame (FDF) and fiber jumper cable racking will be provided from the FDF to the collocator's equipment.

d. The average central office configuration assumes that the collocator's equipment will be placed on the third floor and 2 floor bores will be required.

e. A combined total of 10 man hours will be required to pull the fiber cable from the manhole to the FDF and 8 man hours to splice the fiber cable at the FDF. Nonrecurring costs provided using fully assigned labor rates.

f. Although Bell Atlantic will maintain the collocator's cable, no expenses are included for maintenance since it is anticipated that the cable will require very little testing, monitoring or rearrangements. No recurring capital costs for the cable were included since it is provided by the collocator for a nominal sum.

2. Scenario 2:

a. The collocator's cable will be spliced in the central office vault to new Bell Atlantic, pre-connectorized, fire retardant cable. The fiber cable from the vault to FDF is provided by Bell Atlantic. Because Bell Atlantic is providing the cable, the monthly recurring costs (excluding maintenance) are included in the study.

b. The cable support from the vault to the FDF will use all cable racking and no conduit is required. Fiber jumper cable racking will be provided from the FDF to the collocator equipment. The average central office configuration assumes that the collocator's equipment will be placed on the third floor and 2 floor bores will be required.

c. For splicing at the FDF, all cable will be pre-connectorized cable so that only one hour will be needed for testing, rather than the eight hours under Scenario 1.

d. A combined total of 10 man hours will be required to pull the to pull the collocator's fiber cable from the central office manhole to the vault.

e. When splicing In the vault, 6 hours to splice the collocators cable to the Bell Atlantic cable. This is a meld between the 4 hour mass fusion method and the 8 hour non-fusion method.

f. Fully assigned labor rates were used for Scenario 1 and 2.

B. DS3/DS1 Cross Connect - Virtual

1. Bulk investment was divided by demand to determine the per unit DS3 and DS1 investment. New demand figures were used for the virtual cross-connects based on 1996 data associated with existing virtual collocation arrangements. Physical cross-connect demand figures were based on conversations with collocators and collocator input associated with physical collocation arrangements. Listed below are the assumptions for developing the demand:

a. All circuits come into the collocator's equipment at the optical level, and interconnect to Bell Atlantic's equipment as DS3s, or multiplexed within the collocators own equipment and interconnect to Bell Atlantic equipment as DS1s.

b. The average total number of DS3s per collocation arrangement per central office that are equipped in the collocator's equipment is 12.

c. The average number of these DS3s that continue on as such and interconnect to Bell Atlantic equipment as DS3s is 6. This is the number that will be used to reduce bulk costs to the DS3 circuit level.

d. The average number of DS3s that are multiplexed by the collocator and interconnect to Bell Atlantic equipment as DS1s is 6

e. The average number of DS1s that are handed off to BA: 168. (6*28=168, where 28 represents the total number of DS1s in a DS3). This is the number that will be used to reduce bulk costs to the DS1 circuit level.

f. Average number of collocator's per central office is 1.67.

g. The demand numbers are the same for both physical and virtual, and are per collocation arrangement per central office.

2. The cost of Items 3-6 (Maintenance Expense, Bay, Storage Cabinet and Fiber Distribution Shelf) is allocated between the DS3s and DS1s. Items 1 and 2 (EDSX and cable) are DS3 or DS1 specific.

3. All collocation cross connects use the Electronic Digital Cross Connect (EDSX) equipment, which is consistent with the DS3/DS1 studies for non-collocation services which also use 100% EDSX on a forward-looking basis.

4. The average length of coaxial cable for DS3s and the ABAM cable for DS1s between the collocator's equipment and Bell Atlantic equipment is 100 feet

5. Collocator's equipment:

   a. Because the collocator provides multiplexer/fiber transmission equipment to Bell Atlantic for a nominal sum, only maintenance and administrative expenses are included.

   b. There are three sizes for the equipment shelf: 3 DS3s, 12 DS3s and 48 DS3s. Based on experience of existing collocation arrangements, the average collocator will have one shelf with a capacity of 12 DS3s. The maintenance and administration expenses are based on the average equipment shelf.

c. The maintenance costs are based on Bellcore provided failure rates for two types of equipment shelves. The annual failure rate times the average labor hours per job times the labor rate equal the annual basic maintenance expense for the collocator's equipment. These are known as the activity-based costs, or ABC.

d. The administration factor was multiplied by the weighted investment to develop recurring administration expenses.

e. Full loadings for land, building and power were applied to the investment to develop these costs.

f. The total maintenance expenses shown in Item 3 on the summary sheet are the sum of the ABC maintenance costs, administration expenses, land, building and power/common equipment costs.

6. Supporting structures for collocator's equipment:

a. Storage cabinet: Bell Atlantic provides the storage cabinet to house the collocator's maintenance spare equipment and tools. One unit is dedicated to each collocator. There are 2 types of cabinets used in Bell Atlantic. Where relay rack space is available, a rack mounted cabinet is used. Where relay rack space adjacent to the collocators equipment is not available, a stand alone cabinet is used to store the spares and tools. Based on experience of existing virtual collocation arrangements, 2/3 of the cabinets are stand alone and 1/3 of the cabinets are relay rack mounted.

b. Equipment Bay: The cost shown assumes that a bay is dedicated to one collocator and is provided by Bell Atlantic. The average job is for the 12 DS3 shelf.

8. Fiber distribution frame and shelves:

a. To obtain a per collocator investment, the cost of a fully loaded fiber distribution frame was divided by the unit investment of the capacity of a 24 pair fiber cable provided by the collocator. A fully loaded FDF contains 108 6 pair connectors. The collocator investment is 4 of the 6 pair connectors.

b. The cost of 24 connectors and 4 jumpers was added to the FDF.

c. The FDF is shared by all services, and individual shelves are shared by collocators only.

C. Nonrecurring costs (NRC) for the Collocator's Virtual Multiplex Equipment:

1. Based on the following vendor meld provided by PLM, except for Items 20 and 21, which are done by Bell Atlantic technicians:

    - 30% Option I
    - 40% Option II
    - 10% Option III
    - 20% Option IV

    It was felt that this meld represents the closest possible surrogate of what is actually happening in the field.

3. All prices are per shelf, except for Item 18 which is per channel bank, Item 19, which is per bay, and Item 21, which is per card.

4. Prices are only for nonrecurring labor. No material prices are included.

5. Costs include the labor required to install an average 100 feet of cable between the collocator's equipment and the Bell Atlantic cross connect.

D. Design and Planning Fee - Virtual:

1. This represents hours spent by Bell Atlantic personnel in planning, designing and implementing a proposed Collocation site.

    Three scenarios are given:

    a. For a single fiber entrance into a central office.
    b. For a dual fiber entrance into a central office.
    c. For a typical upgrade requiring planning that does not involve a new entry.

2. Estimated labor hours are for an average type job.

3. Labor rates are fully assigned.

4. The detailed description of labor functions is provided in the physical design and planning section below, since the five virtual functions are the same as the first five functions in physical.

III. PHYSICAL COLLOCATION

A. Cable Support Portion:

This assumes that the physical design is almost identical to a virtual cable support, therefore, Bell Atlantic used the same prices and distances as in the virtual study except as noted below. The collocator has an option of providing fire retardant or non-fire retardant fiber cable from the central office manhole to the collocator's cage. A 50/50 weighting of each scenario was used to develop an average.

1. Scenario 1:

   a. There is no splice in vault and the collocator provides standard non-fire retardant 24 pair fiber cable. The collocator is responsible for the maintenance of their own cable.

   b. The combination of the cable rack and conduit from the vault to the collocator's cage is included, however, the last 50 feet of fiber jumper racking is not included.

   c. Two floor bores are required to deliver the fiber cable from the vault to the collocator's cage.

   d. A total of 10 man hours to pull the fiber cable to the collocator's cage. The collocator will do their own splicing within the cage.

2. Scenario 2:

   Same as Scenario 1, but with the following exceptions:

   a. The collocator provides 24 pair fiber fire-retardant cable.

   b. The cable support from the vault to the collocator's cage is all cable racking.

B. DS3 Cross Connect - Physical:

1. The demand numbers and assumptions are the same as virtual. See Section II.B.1.

2. DS3 EDSX: All collocation cross connects use the Electronic Digital Cross Connect (EDSX) equipment, which is consistent with the DS3/DS1 studies for non-collocation services which also use 100% EDSX on a forward-looking basis. The investment to extend the EDSX ports to a remote location would significantly increase the DS3 investment, therefore Bell Atlantic will not use the DS3 port extension as an option. The alternative of using DS3 repeaters in 15% of the physical collocation applications reduces the investment for the DS3.

a. The shelf and ports of the EDSX will not be extended because one of the major EDSX-3 vendors requires a very expensive optical extension kit when using an extended EDSX in a remote bay.

b. For DS3s, repeaters will be used only part of the time. These details are provided in the repeater section.

3. COAX cable between collocator's equipment and BA equipment: The average distance of the coaxial cable for DS3 services is 250 feet. The installation cost of the cable was added to the recurring cost and capitalized as a monthly cost. In the virtual study the cable installation cost was included in the nonrecurring cost to install and engineer the collocator's multiplex equipment. In physical collocation, the collocators will install their own equipment, so the I installation cost of the cable is included in the cross-connect rate. This cable is dedicated to each collocator.

4. Cable rack and conduit to support the COAX cable mentioned in #2 above:
The average distance of cable rack is 250 feet and no conduit is required. The costs to be shown are per DS3/DS1 circuit per average 250 foot run. To obtain the per foot cost, divide the total by 250. In 1993, the collocators were willing to accept a cable rack path that was shared by both collocators and other BA customers in return for a and the 1996 study assumed that they are still willing to do so.

5. Repeaters: For DS3s, assume that the repeaters will only be used 15% of the time. This is because repeaters are not necessary when the COAX cable is less than 200 feet with the small gauge and less than 400 feet with the large gauge. Bell Atlantic did an analysis based on a 50% sampling of central offices previously identified in the tariff and determined that 15% of the DS3 collocated circuits would require repeaters. Details of this study follow:

    a. DS3 - Consists of the following components:

        1. Primary repeater per DS3
        2. Shelf, including backup power supply
        3. Bay
        4. Backup repeater per DS3 - shown as an optional rate element

    b. Used new repeater vendor, since its prices were lower than the previous vendor.

    c. The DS3 repeater price is $1120.53, plus installation. The 15% repeater frequency factor was applied to this element.

    d. The material price of a shelf that can accommodate 16 repeaters is $459, plus installation and engineering costs. This cost includes a backup power supply. The 15% factor was applied.

    e. The Engineering, Furnish & Install (EF&I) cost of a bay was also included and the 15% factor was applied.

f. The backup repeater is shown as an option at full cost without the 15% factor being applied because a collocator may choose whether it want one to be provided.

g. The option of extending the EDSX shelf in lieu of repeaters was considered, however, the cost of a remote port for DS3s was significantly higher than the 15% repeater factor.

6. Digital Signal Physical Test Access Points (DSPAPs): Used as an acceptance test point during installation, as a wiring zone for interconnects and an equalizing test point for maintenance.

   a. Components for DS3:

      1. One DSPAP per DS3
      2. Shelf
      3. Front and rear locking shelf covers.
      4. Bay

   b. One DSPAP is required for physical cross-connects that use no repeaters, while two are needed for circuits with repeaters. Because comparable access charges presently do not include the cost of DSPAP, the cost is not included in the collocation costs where no repeater is needed. Where repeaters are used, however, the cost of one DSPAP is included. Because repeaters are needed 15% of the time, the cost study included the cost of DSPAPs for 15% of the DS3 cross-connects. Note, however, that the cost of the DSPAPs are included in the 1997 DS3 annual access rate. Those costs will be added into the collocation tariff for cross-connects with no repeaters in the next update.

C. DS1 Cross Connect - Physical

1. DS1 EDSX: All collocation cross connects use the Electronic Digital Cross Connect (EDSX) equipment, which is consistent with the DS3/DS1 studies for non-collocation services which also use 100% EDSX on a forward-looking basis.

   a. The shelf and the ports of the EDSX for DS1 service will be extended 225 feet into a bay that is remote from the main EDSX. The collocator's ports will then be only 25 feet from the collocator's area. This will eliminate the need for repeaters. The cost of remoting a DS1 port of the EDSX is less expensive than using repeaters and does not require the additional software that DS3 remote bays require.

   b. Each shelf can hold 224 DS1s, and each bay can hold 4 shelves. Because of the number of DS1's per shelf, collocators can share a shelf, where as a shelf of DS3 ports will be dedicated to a single collocator.

   c. The cost of the remote EDSX shelf and ports will not be added to the study since this investment is already being picked up in the EDSX cross connect element.

2. Cable:

   a. ABAM cable: The ABAM cable is the electrical DS1 cable between the collocator area and the extended EDSX shelf. The average length here is 25 feet. This cable is dedicated to each collocator.

   b. Fiber cable: The 225 feet of DS1 cable connecting the extended EDSX shelf with the main EDSX. Only 175 feet is actually costed out, since it is assumed that the first 50 feet is included in the EDSX element. To accommodate the DS1 demand of 281 (168 DS1s per collocator times 1.67 collocators per CO), there will be six cables at $442 apiece (material). Installation costs of the cable will not be included here since most of the cost (termination) is being picked up in the EDSX cost element.

   c. LAN/Eithernet cable: Connects the remote EDSX to the main EDSX controller. Same assumptions as in "b" above, except that the per cable cost is $94, and only two cables are required.

3. Bay for the extended EDSX: The cost of the bay at 85% fill is already included in the DS1 EDSX cost, however the remote bay will be dedicated to the collocators and have a much lower fill. To account for the cost of the additional unused space, the difference between the 85% fill and the much lower fill of the bay was taken and applied to the total bay investment to develop that portion of the bay that will be charged to the collocators. The material cost of the bay is $1,489.94 ($965.94 for the bay and $524 for the fuse breaker panel). The install/engineer price that was used for the repeater bay was applied here. The bay will be shared by all collocators in the CO, but not with other BA customers.

4. Cable rack to support the ABAM/fiber/LAN cable: Same methodology as DS3.

5. There are no repeaters are used with DS1s. No DSPAP costs were included in this study, as discussed above in connection with DS3 cross-connects. The cost of one DSPAP will be included in the next collocation tariff to be consistent with the annual access filing.

D. Power for Physical:

1. Costs are shown for a 10 amp circuit from a 150 amp source. A 20 amp circuit will cost twice the 10 amp circuit.

2. Diverse routing will be costed on an individual case basis if requested.

E. Design and Planning Fee - Physical:

1. This represents hours spent by key members of the Product Team in planning for a proposed collocation site. Three scenarios are given:

    a. For a single fiber entrance into a central office.
    b. For a dual fiber entrance into a central office.
    c. For a typical upgrade requiring planning that does not involve a new entry.

2. Labor hours based on estimates from Bell Atlantic field personnel.

3. Several functions that are unique to physical collocation were included. They include personnel from real estate, security, power and insurance/risk management.

4. Labor rates are provided as fully assigned.

5. The description of the design and planning fee job functions are shown on the spreadsheet. Items A, B and C apply to both physical and virtual. Item D applies to just physical.

A. Project Coordination

- Local collocation coordinator: Coordinates overall planning with all local personnel involved for installing and engineering a new site or upgrade.

- Collocation product manager: Coordinates planning and design with local collocation coordinator and regional functions.

- Collocation administrative: Assists the collocation product manager with the paperwork and other follow-up work required to plan and design a collocation site.

B. Engineering - outside plant network: Does the design and planning for the cable support facilities from the manhole to the collocator equipment.

C. Network operations - central office: Does the design and planning for the equipment and facilities from the collocator equipment to the Bell Atlantic cross connect.

D. Other:

1. Real Estate: Does the necessary planning and pricing for the CO space to be used by the collocator.

2. Security: Addresses all issues regarding security and collocator access to the CO.

3. Power: Plans and designs the power equipment used for physical collocation.

4. Insurance and Risk: Addresses issues concerning insurance, risk and liability.

F. Collocation Circuit Nonrecurring Costs - Physical and Virtual DS3/DS1:

1. Although the collocation tariff currently show rates of $1.00 for a first installation and $.75 for an additional installation, the cost support includes the actual nonrecurring costs for this work.

2. The numbers being provided are the nonrecurring costs to order and install a collocated DS3 or DS1 circuit after the collocation arrangement and its associated equipment are in place.

3. The five job functions involved in the installation of a non-collocated circuit are listed below, along with a description explaining how they apply (or may not apply) to collocation. These nonrecurring costs are shown per DS3 or DS1 circuit:

   a. Circuit provisioning designer: Prepares layout records, assigns interoffice facilities, prepares assignment records and assigns CO equipment. Applies in full to collocation.

   b. Circuit provisioning clerical: Processes layout records, service orders and updates database records. Applies in full to collocation.

   c. Central office equipment technician: Does the cross connect work and installs plug-ins in the central office. In virtual collocation, the plug-in work is covered in the nonrecurring equipment section of the tariff. In physical collocation, the collocators install their own equipment. Therefore, the plug-in labor hours do not apply here. The estimated testing and install time for a plug-in is about two hours. One hour of testing is still required by a Bell Atlantic CO technician, so the one hour of plug-in time was subtracted from the total standard time for this function.

   d. Central office Special Service Center technician: Processes the service order, tests the circuit, forwards completion data to other work groups. Applies in full to collocation.

   e. Plant install: For non-collocated services, installs the drop wire (from pole to building) network interface and network channel termination equipment on the customer premise. In collocation, the equivalent of these installation labor hours are accounted for in the cable support nonrecurring tariff rate. Therefore, the plant install function as defined here does not apply to the collocation nonrecurring circuit study and the labor hours are shown as zero.

4. An "additional" circuit is defined as the second or third circuit of the same type as the first going in on the same day, for the same customer and at the same location.

5. The service order function includes the time for a service representative to negotiate the order with the customer, type the order and issue it. This cost is applied on a per-order, not per-circuit basis.

For collocation, the study assumes that all "additional" circuits will be placed on the same order as the first.

6. Nonrecurring costs are a meld of switched and special. A factor was applied to the switched labor hours to eliminate duplication of costs that are being recovered in another element.

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ATTACHMENT E

DESCRIPTION

OF

ANNUAL COST FACTORS

Attachment E

Attachment E contains a description of each annual cost factor.

Bell Atlantic performed cost studies to determine the investment underlying the recurring rates for the cross-connect, cable support, DC power, and network cable rack components of its expanded interconnection services. The first stage in the development of recurring costs is the identification of service-specific investments and the application of land and building factors to those investments to determine the "loaded" investment. The second stage in the development process is the application of annual cost factors ("ACFs") to the loaded unit investments for each recurring rate element to calculate the direct unit cost. ACFs are designed to capture the on-going costs of providing the service.

The recurring direct costs are comprised of two major components -- capital costs and operating expenses. The capital costs are a function of the investment required to provide interconnection services, and consist depreciation, cost of money, and income tax expense. The operating expenses result from the on-going use of the equipment, and consist of maintenance expenses, administrative expenses, and other taxes. The following section contains a detailed explanation of how the factors are developed and what they are designed to recover.[1]

Capital Cost ACFs

Two types of depreciation are involved in the determination of recurring capital costs -- book depreciation and tax depreciation. Book depreciation is the repayment of invested capital and is a direct component of capital costs. Tax depreciation is the schedule of expense deductions used in calculating income taxes. While tax depreciation is no a

[1] Bell Atlantic applies all six cost components when Bell Atlantic invests in equipment, but applies only the maintenance and administration factors to the equipment that the interconnector supplies for a nominal price.

direct component of capital costs, it is used in the formula for computing income taxes, which are themselves a direct component of capital costs. Tax depreciation is discussed below.

Book depreciation is based on total investment in assets less future net salvage, and on the estimated economic life characteristics. Book depreciation is calculated by plant account and jurisdiction on a straight-line basis using the equal life group method in combination with the FCC-prescribed depreciation parameters for life, salvage, and mortality curve.

Individual depreciation cost factors for the interconnection elements were determined for each Bell Atlantic jurisdiction. For example, a Pennsylvania-specific depreciation cost factor was calculated for each investment type using Pennsylvania's prescribed depreciation parameters. These factors were applied to the unit investment components of each rate element to derive the recurring costs associated with depreciation.

Cost of Money

The cost of money is determined by adding the weighted cost of debt to the weighted cost of equity. The cost of money factors were calculated on a jurisdiction-specific basis by multiplying the net investment base by the composite cost of money rate for each period.

The prospective cost of capital is a key input used in the development of the cost of money annual cost factor. Other key variables include the discount rate, composite income tax rate, and debt ratio.

Income Taxes

The third component of capital costs is the cost factor for income taxes, both state and federal. In computing the income tax cost factor, Bell Atlantic took into consideration the federal and state tax rates, as well as the effects of debt interest, tax depreciation, and other factors. Tax depreciation is calculated separately for book depreciation because it

differs in timing, amount, and characteristics. In particular, some investment components that are included in book depreciation are not included in tax depreciation calculations. Example include social security taxes, which are not used for tax depreciation purposes because they are tax-deductible in the year incurred, and capitalized interest during construction, which is a deductible expense item in the year incurred.

Bell Atlantic's income tax cost factors were calculated for each major class of plant in each jurisdiction. These tax amounts were calculated for the estimated service life of each investment, and were then converted to present worth using the composite cost of money as the discount rate.

Operating Expense ACFs

Maintenance

Maintenance is a recurring expense associated with keeping facilities and equipment in good operating condition. Maintenance includes general supervision, engineering associated with the maintenance work, labor and material costs incurred in the upkeep of plant, rearrangement and changes of plant, testing of equipment and facilities, and miscellaneous expenses such as tolls, supplies, etc.

The maintenance factors used in the Bell Atlantic's interconnection filing are based on Part 32 investment and expense amounts. Expenses, like those associated with equipment and building maintenance are divided into the representative investment dollars to develop a maintenance factor for the component. The sum of the components yielded the annual maintenance factor.

Administration

Administrative expenses are costs required to operate the business and deliver telecommunications services such as planing, forecasting, ratings, selling, and accounting, as well as the cost of carrying support investments and other miscellaneous

items. These expenses cannot be determined precisely on a product-by-product basis in company cost studies.

For each of its jurisdictions, Bell Atlantic performs annual administrative expense studies to estimate administrative costs associated with primary plant investments. The administrative factors used in Bell Atlantic's interconnection filing were developed from corporate accounting data.

Other Taxes

Other taxes reflect taxes that municipalities and other taxing authorities levy against the value of property owned by Bell Atlantic. These taxes include property taxes and capital stock taxes, and vary by jurisdiction and type of investment. For example, in Pennsylvania, both capital stock taxes and property taxes are applicable to land and buildings while only capital stock taxes are applicable to other investments. The other taxes factors were developed from Bell Atlantic part 32 account data.

Bell Atlantic's annual cost factors (ACFs) calculate the capital costs and operating expenses attributable to specific projects. The capital costs recognize plant survivor characteristics, accelerated tax depreciation procedures, tax expenses, and return on investment. The ACFs were multiplied by the investments and divided by 12 to obtain a monthly recurring cost.

For the interstate collocation studies, the following inputs were used:

a. Five year planning period from 1995 to 1999.
b. An estimated forward-looking demand showing 10% growth per year. Since it is very difficult to project collocation demand going out five years, the standard default growth of 10% annually was used in the study instead. Inputs of 11,12,13,14 and 15 were used to simulate the estimated 10% annual growth over five years.
c. No inflation or productivity factors were used, since it was anticipated that the costs and rates would be updated every 12 to 24 months. These frequent updates would take

into account any changes in prices, labor costs, labor hours and productivity improvement.

Annual cost factors (ACFs) are then multiplied against the loaded unit investments for each recurring rate element and divided by 12 to calculate the monthly recurring cost.

The planning period for the cost study was five years, from 1995 through 1999 using an estimated five-year demand growth. No inflation or productivity factors were applied, since it was anticipated that the prices, labor rates, labor hours and demand denominators would be updated frequently and new costs/rates done every 12 to 24 months. It was expected that this procedure would account for inflation and productivity on a forward-looking basis.

The investment-based factor method of developing the recurring maintenance costs has been replaced with the activity-based cost (ABC) method on most major accounts, such as digital COE, cable and conduit. Maintenance on land and buildings was calculated using the maintenance factor. Estimated recurring labor hours multiplied by the directly assigned labor rates were used for developing the recurring monthly activity-based costs. For a few of the elements, ABC data was not available, so the maintenance factor was used. Directly assigned labor rates were used since the recurring costs are multiplied by an overhead factor. The investment-based factor method of developing the recurring administration expenses was used in this study. Land, building, power/common equipment applied where appropriate.

The investment-based ACF method of developing the recurring maintenance costs has been replaced, in part, by an activity-based cost (ABC) method. This is an effort to refine cost estimation practices. Estimated recurring labor hours multiplied by the directly assigned labor rates were used for developing the recurring monthly activity-based costs. For those cost elements where ABC data is not available, ACFs are used. For example, maintenance on Land and Buildings was calculated using the maintenance ACF. Directly

assigned labor rates were used since the recurring costs are multiplied by an overhead factor.

To develop its non-recurring costs, Bell Atlantic utilized an average of the 1995-96 fully assigned labor rates since no overhead factor was applied to the nonrecurring costs. No inflation or productivity factors were applied since it was expected that updating the studies with new data frequently would account for this. The two year labor rate used for this reason also.

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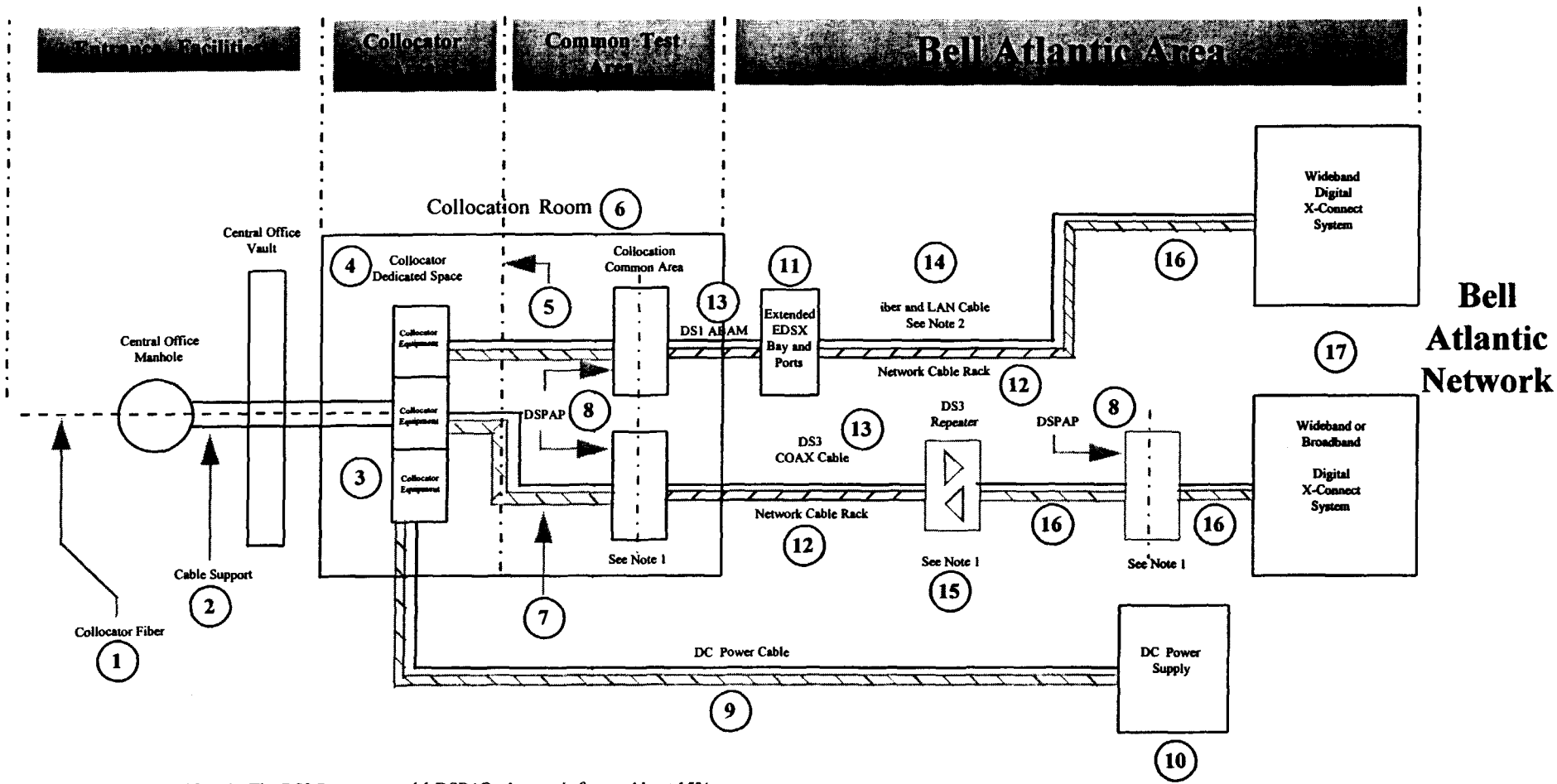
ATTACHMENT F

DIAGRAMS

PHYSICAL COLLOCATION
AND
VIRTUAL COLLOCATION
COMPONENTS

Bell Atlantic Physical Collocation



Note 1: The DS3 Repeaters and 1 DSPAP element is factored in at 15%

Note 2: Fiber and LAN cable to Extended EDSX Bay and Port(s).

ZZZ : Network Cable Rack

XXX : Cable Rack

PHYSICAL COLLOCATION DIAGRAM

1. **Fiber Cable:** The fiber cable to the collocator's dedicated space is owned by the interconnector.

2. **Cable Support:** The cable support structure is owned by Bell Atlantic. It includes a combination of the cable rack and conduit from the central office manhole to the collocators dedicated space.

3. **Collocator Transmission Equipment:** Transmission equipment within the dedicated space is owned by the interconnector.

4. **Collocator Dedicated Space:** The dedicated space is owned by Bell Atlantic and leased to the Interconnector (Occupancy Fee).

5. **Cage:** The cage is owned by Bell Atlantic.

6. **Collocation Room:** The collocation room and secured access is owned by Bell Atlantic

7. **Cable and Cable Support:** The DS1 and DS3 electrical cable is to connect the interconnector's transmission equipment to the point of interconnection is owned by the interconnector. The cable support for the electrical cables is owned by Bell Atlantic.

8. **DSPAP Panels:** The DSPAP panel are part of the cross connect and are owned by Bell Atlantic.

9. **Power Cable and Cable Support:** The DC power cable and cable support is owned by Bell Atlantic. All power cables must be on a separate cable support from transmission cables.

10. **DC Power Supply:** The DC power plant is owned by Bell Atlantic.

11. **Extended EDSX Bay and Ports:** The Extended EDSX Bay and Port(s) is owned by Bell Atlantic and is part of the DS1 cross connect.

12. **Network Cable Rack:** The network cable rack dedicated to collocator space is owned by Bell Atlantic.

13. **DS1 and DS3 Cable:** The DS1 and DS3 electrical cables that connect the DSPAP panel to Bell Atlantic Network Elements are owned by Bell Atlantic and are part of the DS1 and DS3 cross connect.

14. **Fiber and LAN Cable:** The Fiber and LAN cables connecting the Extended EDSX Bay and Port(s) to the EDSX are part of the DS1 cross connect and are owned by Bell Atlantic.

15. **DS3 Repeaters:** The DS3 repeater and bay is owned by Bell Atlantic.

16. **Cable Support:** The cable support shared by Bell Atlantic and Collocator facilities is owned by Bell Atlantic and is part of the DS1 and DS3 cross connects.

17. **EDSX:** The Wideband and Broadband Digital cross connect systems are owned by Bell Atlantic and are part of the DS1 and DS3 cross connect.